

How People Experience Facial Recognition in an Organizational Setting: An Organizational Justice Perspective

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ABSTRACT

Facial recognition technology (FRT) is now being introduced across various aspects of public life. In organizations, FRT could be seen as a logical extension of technology-based surveillance trends established decades ago. However, the controversial nature of FRT and improper uses often generate critical concerns and even resistance. Current research on human interaction with FRT mainly focuses on individual level and the digital contexts, while studies on FRT in organizational settings are relatively rare. To fill this gap, we investigated people's lived experiences with a facial recognition system called FaceEx on a university campus in the United States, and how they constructed the perception of justice and responded accordingly. In this paper we report part of findings from eighteen interviews with people encountering the FaceEx system. Drawing from the lens of organizational justice, we reported how they constructed the perception of justice and how the perceived justice was violated by organizations. We expect to report more findings to reveal organizational justice issues related to controversial technology implementation and how to achieve transparency in algorithmic system.

KEYWORDS

Facial recognition system; Human computer interaction; Organizational justice; Surveillance; Ethics

INTRODUCTION

many people are broadly welcoming (or at least begrudgingly accepting) of the various pro-claimed benefits to deploying this technology, concerns are growing regarding the place of facial recognition technologies (FRT) in democratic society. Imperatives being raised include issues of diminished accountability, compromised civil rights, hidden bias, and limitations on the concentration of power. Despite that facial recognition technologies have been widely adopted in workplace and educational institutions, most research efforts on human interaction with FRT have been devoted to individual level and the digital contexts (e.g., face unlock on smartphone, face tagging on social media, etc.) (Bhagavatula et al., 2015; Ellerbrok, 2011). Empirical research focuses on FRT as organizational surveillance is relatively rare (Stark et al., 2020).

The implementation of FRT as a controversial surveillance technology has large impact on organizational justice. New technology-based surveillance tools may enhance organizational justice by giving rewards based on performance monitoring (Alder & Tompkins, 1997), but it could also compromise organizational justice by invading subordinates' privacy and further make subordinates feel unfair (Chory et al., 2016). However, most related studies to date were quantitative and did not capture the in-situ, nuanced human-surveillance technology interactions. In addition, limited research has been conducted specifically on organizational justice issue associated with FRT.

To fill the research gap, we ask: *What are individuals' lived experiences of facial recognition technology in an organizational setting? How organizational justice is fulfilled or violated from users' perspective?* we conducted a qualitative study in a public university in the United States, using semi-structured interviews. The study took place right after the implementation of a facial recognition system at a makerspace in a campus building. The whole project is expected to contribute to current literature by 1) providing empirical and conceptual insights into people's interaction

with an actual facial recognition system in public, 2) reflecting the controversiality of FRT in an organizational setting, and 3) revealing organizational justice issues related to the implementation of controversial technologies.

RESEARCH BACKGROUND

In January 2019, a facial recognition system was installed in a makerspace in a public university in the United States. It provided open access to university members. People who frequently used the makerspace included faculty, students, makerspace managers and other staff.

The facial recognition system is a product of the FaceEx company. The company states that the system has high recognition accuracy and huge data storage space. The interface of the system consists of several parts (see Figure-1): The picture at the center shows the real-time faces the device's camera captures. The block below shows a matched record from the university's database, including name, ID photo, and university ID number. The verification light on the right side turns green after a successful match. The camera is equipped with flashlights to make up light when it is too dark to recognize a face.

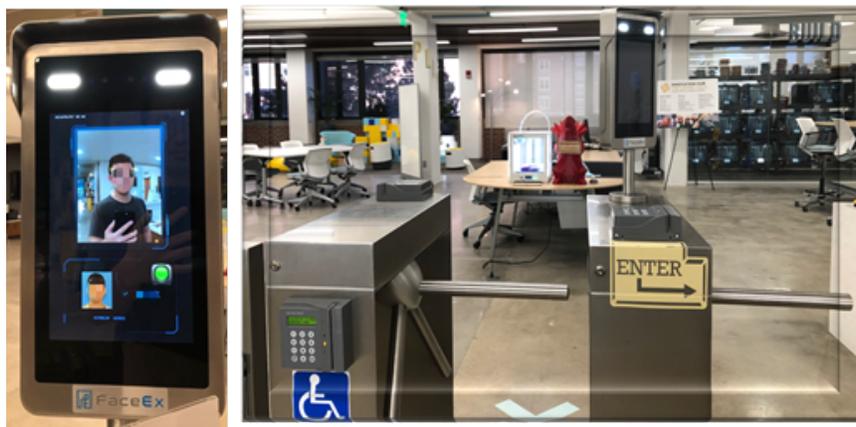


Figure 1. The interface of the FaceEx device (right) and the FaceEx device at the entry system (left). The facial recognition system is mounted on the card swipe entry system

The facial recognition system was implemented with the support of the makerspace administration, the university administration, and the campus police department. The makerspace management team was responsible for explaining the system to people. As claimed by the makerspace management team, the long-term plan is to eventually replace the card swipe system with this facial recognition system. They stated that the new system can enhance campus security by detecting people who is not a university member. Besides, scanning faces is more convenient and faster than swiping cards.

The implementation of the FaceEx system created a new situation that people need to interact with two systems simultaneously at the entry of the makerspace. The makerspace management mounted the FaceEx system on the card-swipe system to let people experience two types of interaction. Since the card-swipe system was the only entry system for people without disabilities (see Figure-1), most people who entered the makerspace through the card-swipe system inevitably exposed their faces to the FaceEx system. The FaceEx system automatically scanned their faces, matched facial information with records in database and showed the matching results on the screen.

THEORETICAL LENS

Organizational justice refers to subordinates' perceived fairness¹ of an organization's decision (Greenberg, 1990). Extended from Adams (Adams, 1963, 1965) equity theory, the literature on organizational justice theory has identified three widely used types of justice: *distributive*, *procedural*, and *interactional* (Greenberg & Colquitt,

¹ Although it is beyond the scope of this paper to address all philosophical conceptions of fairness, one influential philosophical theory of fairness comes from the 20th century philosopher John Rawls, who famously equated fairness and justice, arguing broadly that fairness is “a demand for impartiality”. Since this landmark work, scholars have often used “justice” and “fairness” interchangeably.

2013). Although all three types of justices have been linked to similar positive outcomes, they are conceptually distinct from one other and represent different lens through which to evaluate justice (Colquitt et al., 2001).

Distributive justice refers to fairness with respect to the allocation of outcomes (Adams, 1965; Deutsch, 1985). Distributive fairness aligns closely with Adams' equity theory. (Leventhal, 1980) identified three factors affecting evaluation of distributive justice: *equity* (outcome distributed based on input, e.g., contribution (Adams, 1965)), *equality* (outcome distributed equally to everyone (Leventhal, 1976)), and *need* (outcome distributed to care for people in need (Leventhal, 1976)).

Procedural justice is defined by the process employed to reach or decide the final outcome (Thibaut & Walker, 1975). People may perceive final outcomes as (un)fair depending on the process of determining the outcome, and even unfavorable outcomes can be perceived as fair given fair procedure (Thibaut & Walker, 1975). Leventhal (1980) proposed six principles to ensure people have perceived control of decision-making process thus have perceived fairness: *consistency* (being consistent through time and across populations), *neutrality* (being free from the conflict of interest), *accuracy* (collecting and using accurate information), *correction* (cancelling or revising wrong decisions), *ethics* (complying to social norms), and *voice* (listening to all stakeholders).

Interactional justice refers to the "style" with which distributions are made and announced, and with which organizational procedures are enacted (Bies, 1986). Interactional justice has two aspects (Colquitt et al., 2001): *truth* (informational justice; providing adequate, clear, and true information) and *dignity* (interactional justice; being respectful and considerate to individuals). Prior empirical work also suggested multiple methods to explain, including the explanation strategies, soundness and completeness of explanations, and types of information could mediate decision outcomes.

DATA COLLECTION AND ANALYSIS

We conducted semi-structured interviews during the first two months (from January to March 2019) after the installation of the FaceEx system. Recruiting messages were sent to staffs and visitors of the makerspace using direct contact or snowball sampling. In total nineteen participants were selected, including four faculty/staffs and fifteen students. Eight of them were affiliated with the makerspace, including one manager, two graduate assistants, and five undergrad interns. Each participant was required to fill out an online questionnaire reporting basic demographic information. The interviews lasted from 25 minutes to 70 minutes with an average of 45 minutes. All the interviews took place at least 2 weeks after the participants' initial interactions with the FaceEx system.

The interview guidelines were constructed based on previous research on users' reflections/concerns on facial recognition system, especially in school setting (Andrejevic & Selwyn, 2020; Lai & Rau, 2021). The guidelines were divided into three sections. Interview questions included but were not limited to: their previous experience and knowledge about facial recognition system, their initial impressions and concerns of the FaceEx system; Their overall attitudes toward the system and the deployment decision and how their attitudes were constructed.

All of the interviews were audio-recorded, transcribed, and coded using NVivo 12 Pro. An open coding approach (Charmaz, 2014) was used to code interview data, and constant comparison was performed in the coding process. To better understand implicit or unstated meanings and assumptions, memos were written in Nvivo 12 to record the researcher's understanding of emergent themes. To improve coding validity, a second coder coded all interview transcripts again, and reached an agreement reached of 85.6%. The discrepancies were resolved by discussion.

FINDINGS

Due to page limit, we report part of findings related to organizational justice as follows. We will provide more details in the workshop.

Our findings show that the deployment of the facial recognition system in the makerspace has violated all three types of organizational justice. First, in terms of distributive justice, most participants perceived that the organization (e.g., university administration, the makerspace's management team) was unfair to them in terms of the outcomes they received. They felt that their privacy had been invaded, and their concerns of data security, equal access, surveillance and possible abuse of authority were also not addressed or even being taken into account. Thus the dimension of *need* in distributive justice was violated. In addition, they perceived the facial recognition system as an organizational surveillance tool mainly targeting students. A faculty member, for instance, believed that the primary goal of the system was to track students and evaluate their performance. Some participants argued the possible mismatch may

negatively impact certain minority groups disproportionately, resulting in disallowing entry or even being questioned by the authorities. Two participants also mentioned the makerspace was reconstructed from a library and the community nature of this public space used to welcome all community members, which was not the case with the installation of the FaceEx system. To sum up, the negative outcomes were perceived as being distributed unequally in the organization thus the dimension of *equality* was also violated.

Second, from the procedural justice perspective, the decision-making process of implementing the facial recognition system failed to include diverse stakeholders, thus violating the principle of *voice*. As reported by more than half of participants, the manager of the makerspace, the university administration and the makerspace management team decided to implement the system while excluding other stakeholders such as other staff member (e.g., student interns) and visitors. The administration did not consider the needs of fostering technology acceptability, for instance, by encouraging all the stakeholders to discuss the potential risks and benefits openly and equally before actually implementing it. Rather, the administrators simply assumed that such a controversial technology would be eventually accepted and replaced the old system. The decision-making and post-implementation processes should be participatory rather than being persuasive and autocratic. In addition, all student interns did not go through formal training about the mechanism (e.g. the FaceEx system is in fact a livestream device which does not film and record videos like a traditional surveillance camera) of the system, why it was installed, and how the decision was made. Thus inaccurate or conflicting information was provided to visitors and the principles of *consistency* and *accuracy* were violated.

The interactions most participants had with the makerspace management team and the university administration also suggested the violation of both *informational justice* and *interpersonal justice*. From the *interpersonal justice* perspective, the management team of makerspace and university administration failed to show respect for the stakeholders. For example, although the FaceEx company provided information section, only the maker space manager was arranged to attend. Reflections from several makerspace staffs shown that they knew the installation could raise privacy and other concerns among visitors while deemed the privacy concerns baseless or not important. While other libraries on campus refused to have the system installed and raised the potential privacy concerns, the university administration and makerspace management team still decided to install the system in the makerspace. Even when the stakeholders explicitly expressed the concerns, the management team did not take those concerns into account. Regarding *informational justice*, reflections from most participants show both the university administration and makerspace management team failed to provide sufficient explanations regarding how the system worked and why it should be installed, even to most student interns. Our findings also show that not only the content but also the structure matter when making explanations in an organizational setting. After the system was installed, the makerspace management chose a technocratic and bureaucratic structured approach to give explanations. The approach was top-down and one-way, from management to staff and then to visitors. The management sent an email to inform staff and let the staff explain the system to visitors based on the email content. However, the management team did not put effort into evaluating whether the explanation was sufficient or not. When questioned by others, they further failed to provide additional and timely information.

REFERENCES

- Adams, J. S. (1963). Toward an understanding of inequity. *The Journal of Abnormal Social Psychology*, 67(5), 422–436. <https://doi.org/10.1037/h0040968>
- Adams, J. S. (1965). Inequity in social exchange. In *Advances in Experimental Social Psychology*. [https://doi.org/10.1016/S0065-2601\(08\)60108-2](https://doi.org/10.1016/S0065-2601(08)60108-2)
- Alder, G. S., & Tompkins, P. K. (1997). Electronic performance monitoring: An organizational justice and concertive control perspective. *Management Communication Quarterly*, 10(3), 259–288. <https://doi.org/10.1177/0893318997010003001>
- Andrejevic, M., & Selwyn, N. (2020). Facial recognition technology in schools: Critical questions and concerns. *Learning, Media and Technology*, 45(2), 115–128. <https://doi.org/10.1080/17439884.2020.1686014>
- Bhagavatula, R., Ur, B., Lacovino, K., Su, M. K., Cranor, L. F., & Savvides, M. (2015). *Biometric authentication on iPhone and Android: Usability, perceptions, and influences on adoption*. The Workshop on Usable Security 2015, San Diego, CA. https://ink.library.smu.edu.sg/sis_research/3967
- Bies, R. J. (1986). Interactional justice: Communication criteria of fairness. In *Research on negotiations in organizations* (Vol. 1, pp. 43–55). JAI Press.

- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). SAGE Publications, Inc.
- Chory, R. M., Vela, L. E., & Avtgis, T. A. (2016). Organizational surveillance of computer-mediated workplace communication: Employee privacy concerns and responses. *Employee Responsibilities and Rights Journal*, 28(1), 23–43. <https://doi.org/10.1007/s10672-015-9267-4>
- Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Ng, K. Y. (2001). Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86(3), 425–445. <https://doi.org/10.1037/0021-9010.86.3.425>
- Deutsch, M. (1985). *Distributive justice: A social-psychological perspective*. Yale University Press.
- Ellerbrok, A. (2011). Playful biometrics: Controversial technology through the lens of play. *The Sociological Quarterly*, 52(4), 528–547. <https://doi.org/10.1111/j.1533-8525.2011.01218.x>
- Greenberg, J. (1990). Organizational justice: Yesterday, today, and tomorrow. *Journal of Management*, 16(2), 399–432. <https://doi.org/10.1177/014920639001600208>
- Greenberg, J., & Colquitt, J. A. (2013). *Handbook of organizational justice*. Taylor & Francis.
- Lai, X., & Rau, P.-L. P. (2021). Has facial recognition technology been misused? A public perception model of facial recognition scenarios. *Computers in Human Behavior*, 124, 106894. <https://doi.org/10.1016/j.chb.2021.106894>
- Leventhal, G. S. (1976). The distribution of rewards and resources in groups and organizations. *Advances in Experimental Social Psychology*, 9, 91–131. [https://doi.org/10.1016/S0065-2601\(08\)60059-3](https://doi.org/10.1016/S0065-2601(08)60059-3)
- Leventhal, G. S. (1980). What should be done with equity theory? New approaches to the study of fairness in social relationships. In *Social exchange: Advances in theory and research* (pp. 27–55).
- Stark, L., Stanhaus, A., & Anthony, D. L. (2020). “I don’t want someone to watch me while I’m working”: Gendered views of facial recognition technology in workplace surveillance. *Journal of the Association for Information Science and Technology*, 71(9), 1074–1088. <https://doi.org/10.1002/asi.24342>
- Thibaut, J. W., & Walker, L. (1975). *Procedural justice: A psychological analysis*. L. Erlbaum Associates.